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<Outline>

A. Equipment Required

B. Corresponding projectors / Functions

C. Preparation

D. Functions

E. Note

1. Equipment Required

- Software: “Projector Calibration Pro”
- Sony Projector with LAN port (see section 2 for more details)
- PC / Laptop with HDMI interface
- LAN cable
- HDMI cable
- Chroma meter / Illuminance meter (only for advanced calibration)

  Recommended equipment:

  Chroma meter CL-200A (Konica Minolta)

  For Gamma adjustment, Color space adjustment, White balance adjustment

  Illuminance meter T-10A (Konica Minolta)

  For Gamma adjustment

2. Corresponding Projectors / Functions

Function	Home Cinema Projector				Professional Projector	
	VPL-VW1100ES	VPL-VW600ES	VPL-VW500ES	VPL-VW300ES	VPL-GT100	VPL-GTZ1
OSD menu	Yes	Yes	Yes	Yes	Yes	Yes
Gamma adjustment	Yes	Yes*1	Yes*1	Yes	Yes	Yes
Color correction	No	Yes	Yes	Yes	No	Yes
Color space adjustment	Yes	Yes	Yes	Yes	No	Yes
White balance adjustment	Yes	Yes	Yes	Yes	Yes	Yes
Panel alignment adjustment	No	Yes*1	Yes*1	Yes	No	Yes

*1 Firmware version 1.100 and later

Corresponding OS:

Windows 7 (32 bit / 64 bit)

Windows 8 (32 bit / 64 bit)*

Windows 8.1 (32 bit / 64 bit)*

*NET 3.5 SP1 is required to be installed.

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3. Preparation

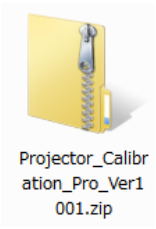
3-1. Install “Projector Calibration Pro”

Double click “Setup.exe” in “Projector_Calibration_Pro_Verxxx.zip” folder to install.

Follow the instructions.

*If you already have an older version installed, please uninstall it before installing the new one.

*When you use Windows 8/8.1, please activate or install .NET 3.5 in advance.

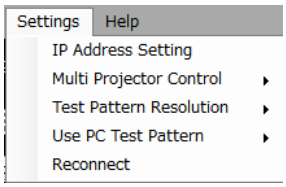


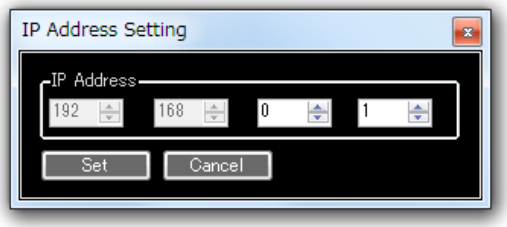
A. If using with a wireless network

3-2-1. Connect the projector to the wireless router with a LAN cable

3-2-2. Enter the IP address of the projector into Projector Calibration Pro

IP address of the projector is automatically assigned by the wireless router.





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B. If using a wired connection between the PC and the projector

3-2-1. Connect the PC and the projector with a LAN cable

Note: if a normal LAN cable doesn't work, try a cross LAN cable.

3-2-2. Connect the PC to the projector with an HDMI cable to extend the PC desktop to the projector

3-2-3. Set the IPv4 network setting of the projector and PC

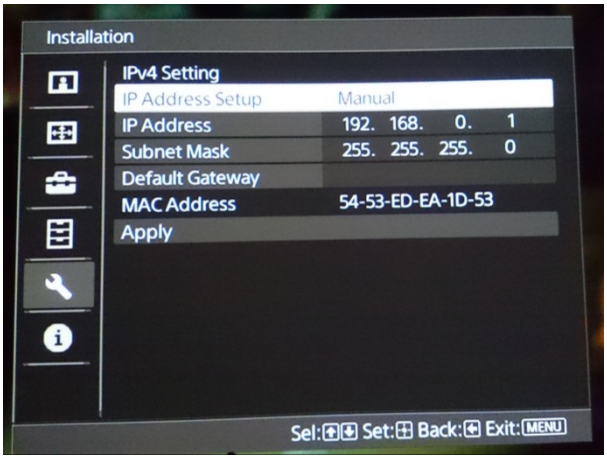
Set the IP address of a projector using the projector on-screen menu.

Set the IP address of the PC.

*Please set different IP addresses and the same subnet mask for the projector and PC.

Example:

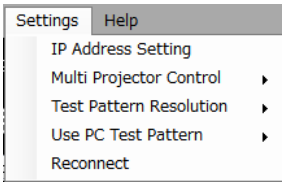
	IP address	Subnet mask
Projector:	192.168.0.1	255.255.255.0
PC:	192.168.0.5	255.255.255.0

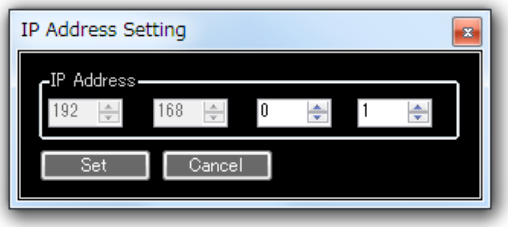


3-3. Launch the Projector Calibration Pro program

Launch the software by double clicking the shortcut created on your desktop.

Set the IP address in the “Setting” → “IP Address Setting” menu to work with the address set for the projector





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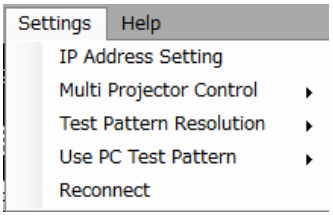
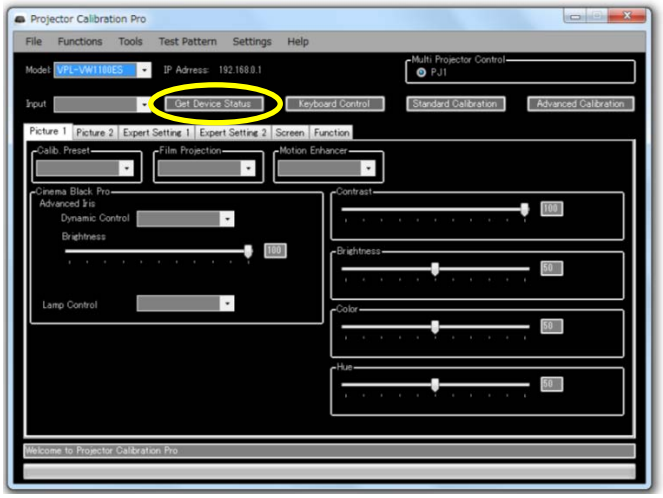
Click “Get Device Status” to get information.

*In case of error, please connect with the projector by “Settings” → “Reconnect” after reviewing all settings.





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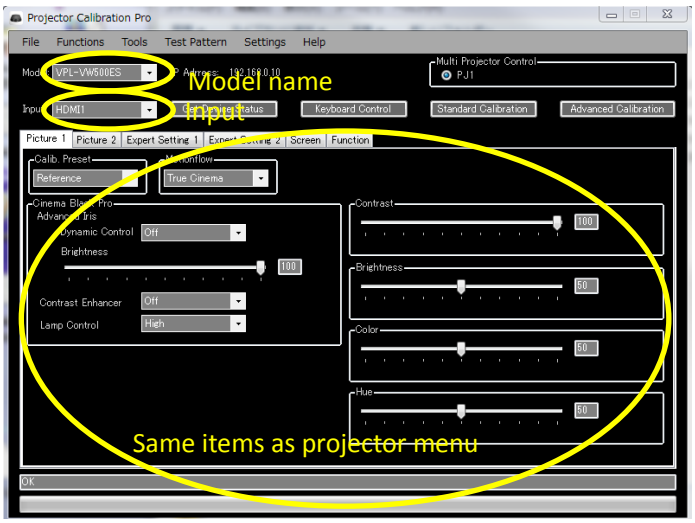
4-1. General

4-1-1. Menu operation

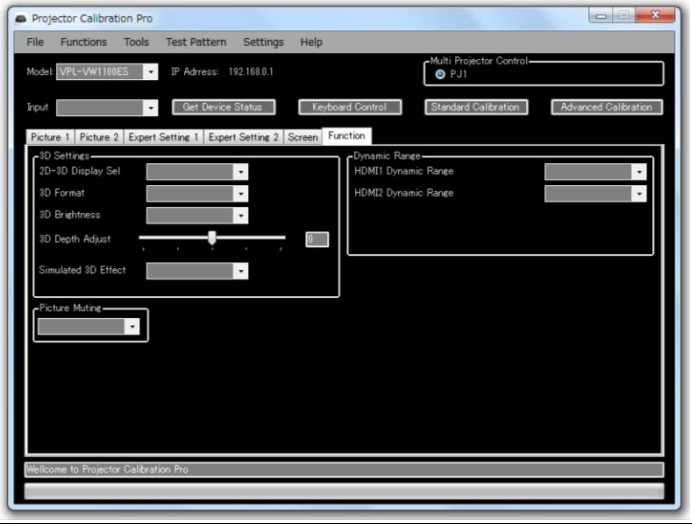
All features of a projector found in the OSD (On Screen Display) menu can be adjusted from the software using the tabs across the window.
Adjustable items vary by projector.



4-1-2. Export / Import CMS file

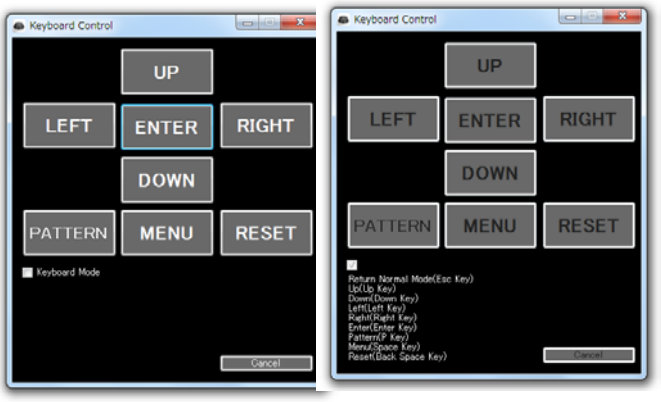
Select [File] – [Export CMS file] to export current/adjusted settings to your PC. You can use this file to copy picture adjustment settings to another projector

Select [File] – [Import CMS file] to import picture adjustment settings from a saved file to the projector



4-1-3. Keyboard control

You can use your keyboard to operate the projector.



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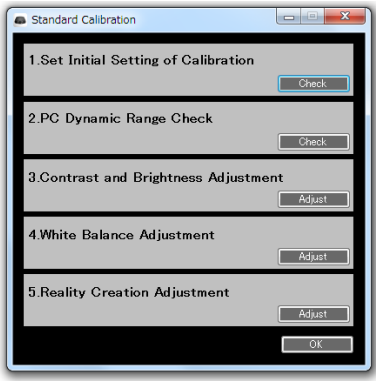
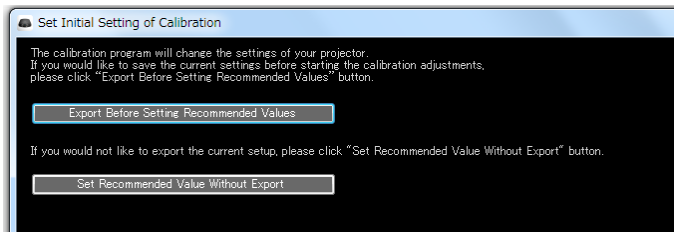
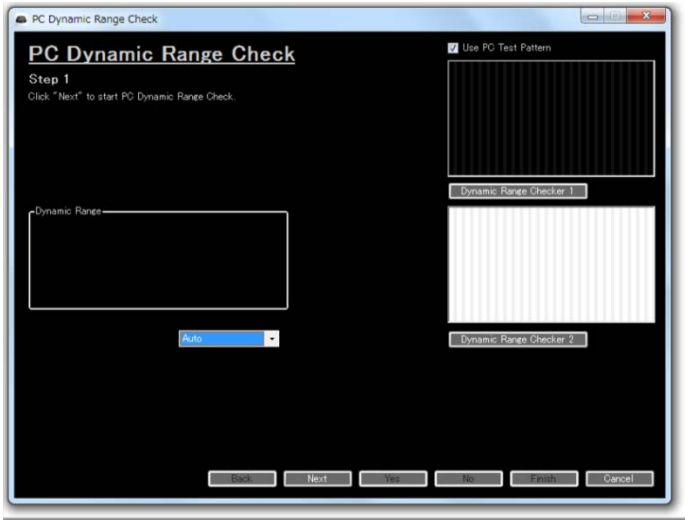
During the following procedures, whenever a test pattern window appears on the PC screen, drag it to the extended desktop of the projector and maximize the window. Clicking in the maximized window will reduce the window size again.	
4-2. Standard Calibration This process provides simple calibration without an external chroma meter or illuminance meter. Following the instructions step by step, you can adjust "Contrast", "Brightness", "White Balance" and "Reality Creation" to desired settings.	
4-2-1. Set Initial Settings for Calibration Choose the picture settings to use before starting the calibration. If you want to save the current picture settings before starting calibration, click "Export Before Setting Recommended Values" If you don't need to save the settings, click "Set Recommended Value Without Export"	
4-2-2. PC Dynamic Range Check Check the Dynamic Range settings of the HDMI or DisplayPort (VPL-GT100) Inputs to prevent errors during the setting process. Follow the instruction steps on the screen. See next page for images when settings are correct and incorrect.	

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Black stripe	**White stripe**
Correct 	**Correct**
Incorrect **When PC setting is "Limited" and Projector setting is "Full"** Brighter than background	**Incorrect** **When PC setting is "Limited" and Projector setting is "Full"**
When PC setting is "Full" and Projector setting is "Limited" No stripes	**When PC setting is "Full" and Projector setting is "Limited"**

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4-2-3. Contrast and Brightness Adjustment

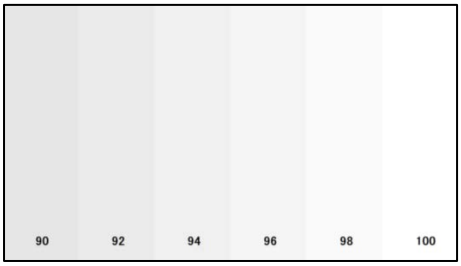
4-2-3-1. Adjust Contrast

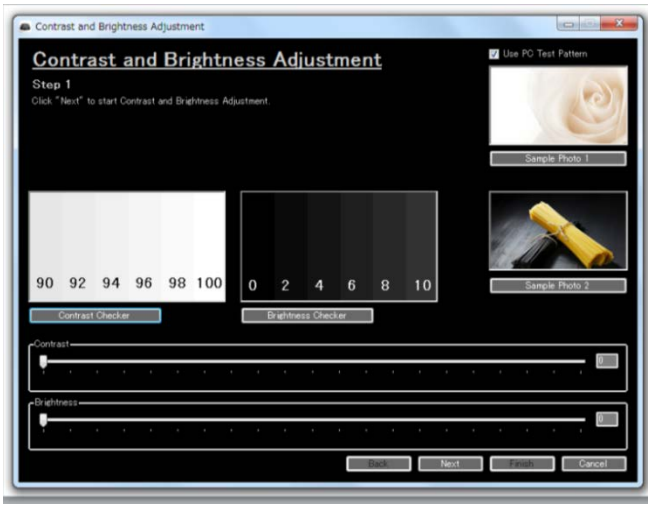
Click next to show “Contrast Checker”

If you can see 6 vertical steps of “Contrast Checker” test pattern, Contrast setting is fine.

If you cannot see 6 steps, please decrease Contrast until they are visible.

“Contrast Checker” test pattern





4-2-3-2. Adjust Brightness

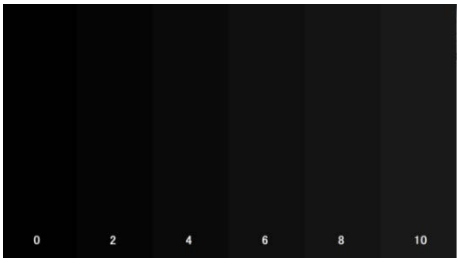
Click next to show “Brightness Checker”

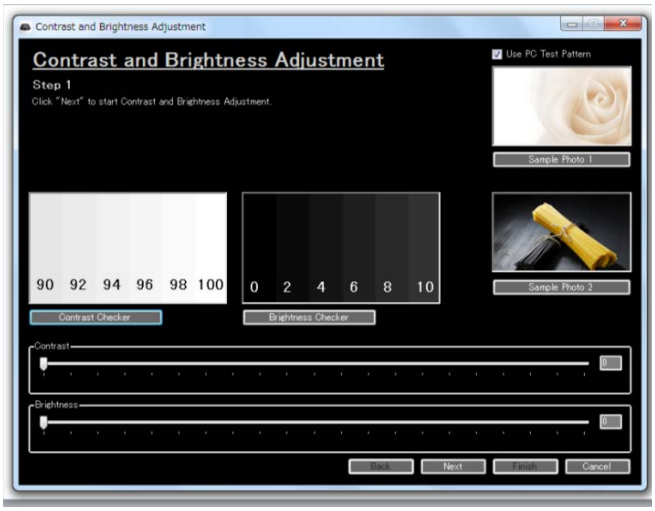
If you can see 6 vertical steps of “Brightness Checker” test pattern slightly, Brightness setting is fine.

If you cannot see 6 steps, please adjust Brightness until 2% step is just visible.

*If you change the value over 10 points, please go back to adjust Contrast because Contrast setting affects Brightness and vice versa.

“Brightness Checker” test pattern





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4-2-3-3. Check Contrast and Brightness with Sample Photos

Sample Photo 1 for Contrast check

Sample Photo 2 for Brightness check

4-2-4-4. Click “Finish” to complete Contrast and Brightness Adjustment

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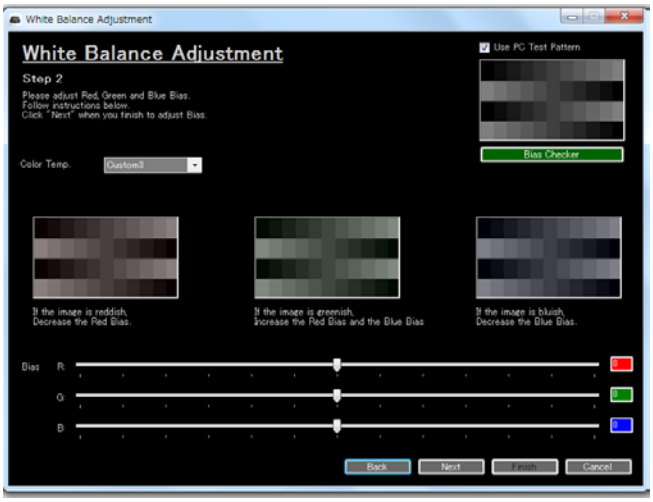
4-2-4. White Balance Adjustment

4-2-4-1. Adjust Bias

Click next to show “Bias Checker”

If the “Bias Checker” image is reddish, decrease the Red Bias.
If the “Bias Checker” image is greenish, increase the Red Bias and Blue Bias.
If the “Bias Checker” image is bluish, decrease the Blue Bias.

“Bias Checker” test pattern

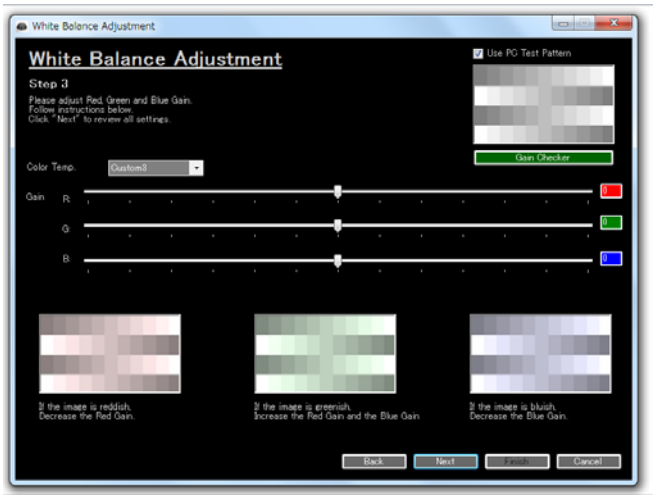


4-2-4-2. Adjust Gain

Click next to show “Bias Checker”

If the “Gain Checker” image is reddish, decrease the Red Gain.
If the “Gain Checker” image is greenish, increase the Red Gain and Blue Gain.
If the “Gain Checker” image is bluish, decrease the Blue Gain.

“Gain Checker” test pattern



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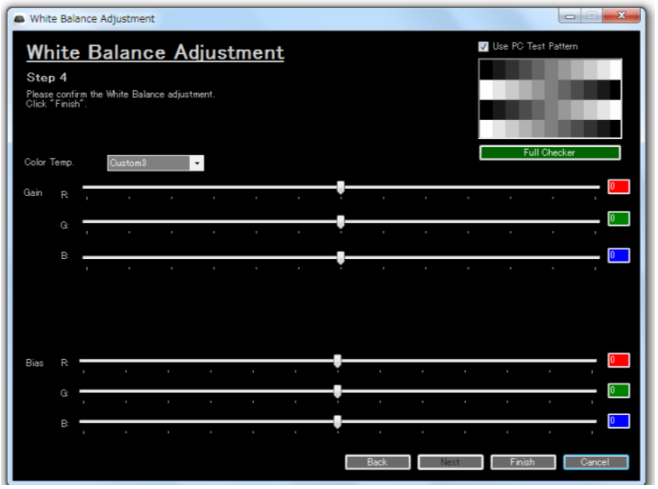
4-2-4-3. Check final settings

Click next to show “Full Checker” to check the final result

“Full Checker”



4-2-4-4. Click “Finish” to complete White Balance Adjustment

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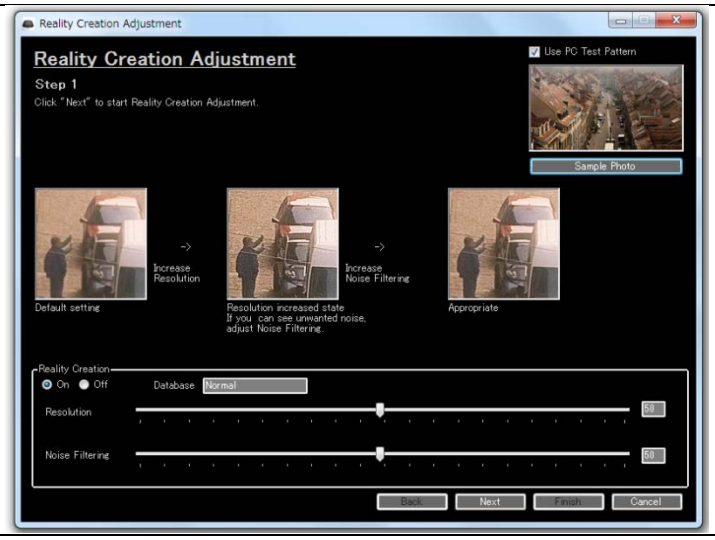
4-2-5. Reality Creation Adjustment

Reality Creation settings are adjusted carefully as a default, however, if you want to increase or decrease Reality Creation, you can adjust by changing Resolution and/or Noise Filtering.

See below for images when settings are appropriate and inappropriate.



Appropriate

Inappropriate

When Resolution is too high

When Noise Filtering is too high

Click [OK] to close Standard Calibration menu window

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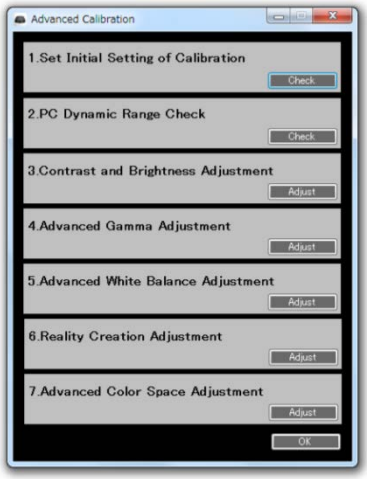
4-3. Advanced Calibration

This advanced mode provides more accurate adjustment through use of an external colorimeter.

Following the instructions step by step, you can adjust "Contrast", "Brightness", "Gamma", "White Balance", "Reality Creation" and "Color Space" at suitable settings.

*Adjustable items vary by projector



4-3-1. Set Initial Settings of Calibration

4-3-2. PC Dynamic Range Check

4-3-3. Contrast and Brightness Adjustment

4-3-6. Reality Creation Adjustment

Operations above are same as Standard Calibration in the section 4-2

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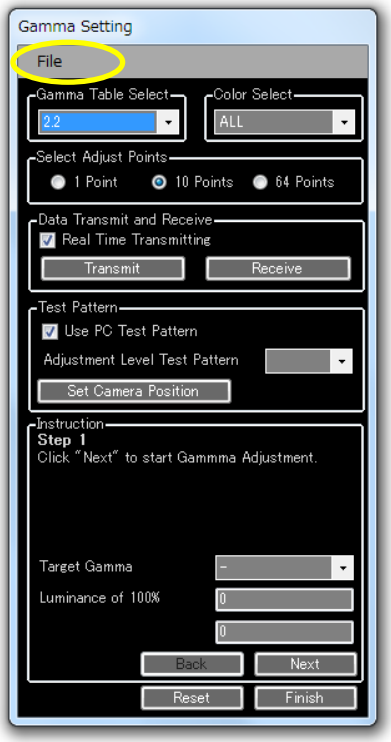
4-3-4. Advanced Gamma Adjustment

Use [File] – [Export GCMS file] menu to save adjusted gamma settings to your PC

Use [File] – [Import GCMS file] to push your saved gamma settings to the projector

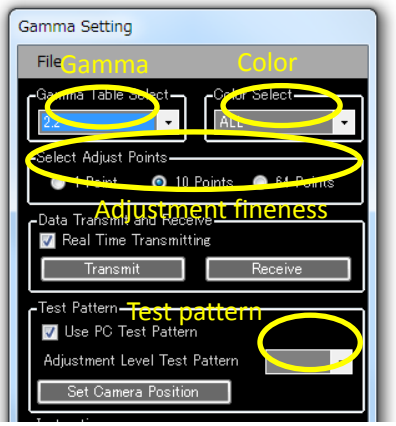
Gamma can be adjusted in two ways by using external equipment.

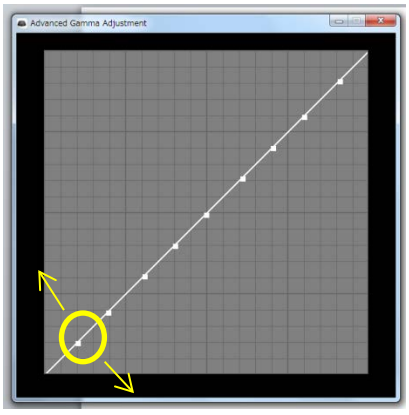
A. Manual adjustment
   Use test pattern to measure and adjust by dragging the gamma diagram to change the gamma curve
B. Interactive
   Set Target Gamma and input measured values by following instructions of the software.



A. Manual adjustment

1. Select the Gamma Table
2. Select color to adjust
3. Choose adjustment fineness
   You can choose "1 point" "10 points" and "64 points"
4. Select Adjustment Level to show test pattern
5. Measure the luminance and then adjust by dragging gamma curve with mouse until you reach to the desired luminance





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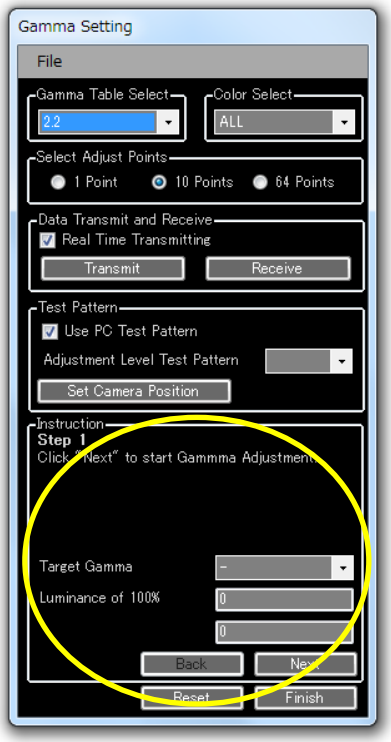
B. Interactive

1. Click next to start
2. Select Target gamma in Instruction box
3. Measure 100 IRE luminance
4. Input the value in the cell “Luminance of 100%”
   Ideal luminance values will be automatically calculated to show on the below box.
5. Measure “Luminance of 10%” and then adjust the by dragging gamma curve with mouse until you reach to the desired luminance.
6. Continue the same procedure for 20% to 90%.
7. Click finish to complete “Gamma adjustment”



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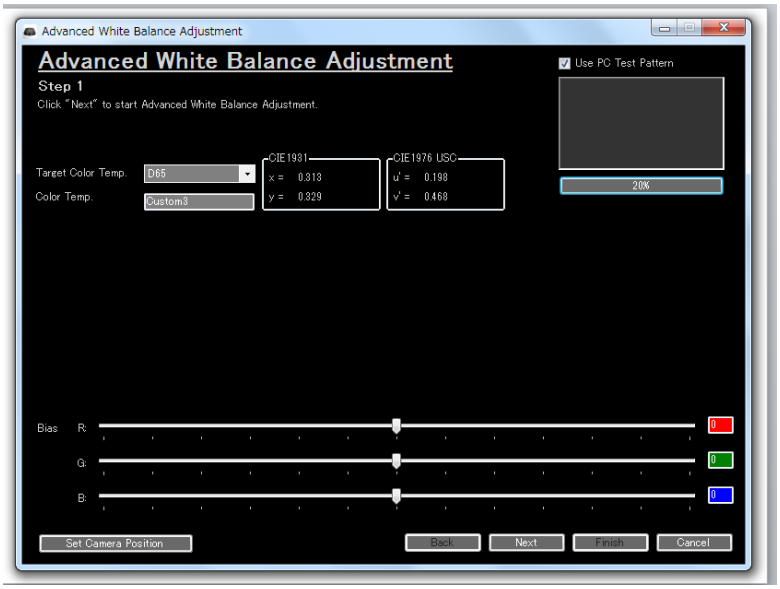
4-3-5. Advanced White Balance Adjustment

4-3-5-1. Choose Target Color Temperature.

Note:

The target values are different for laser light source models



4-3-5-2. Measure "20% Gray" to adjust Bias.

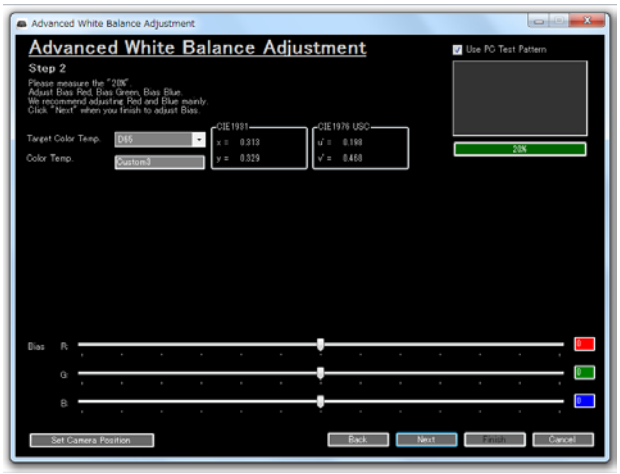
Click next to show "Bias Checker"

If the "Bias Checker" image is reddish, decrease the Red Bias.

If the "Bias Checker" image is greenish, increase the Red Bias and Blue Bias.

If the "Bias Checker" image is bluish, decrease the Blue Bias.

20% Gray



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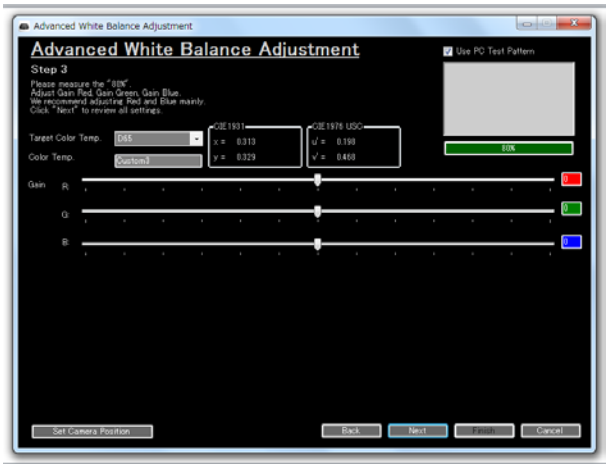
4-3-5-3. Measure “80% Gray” to adjust Gain **Click next to show “80% Gray”** If the “Gain Checker” image is reddish, decrease the Red Gain. If the “Gain Checker” image is greenish, increase the Red Gain and Blue Gain. If the “Gain Checker” image is bluish, decrease the Blue Gain. **80% Gray** 	
4-3-5-4. Confirm White Balance Adjustment Confirm the overall white balance adjustment and click “Finish”	

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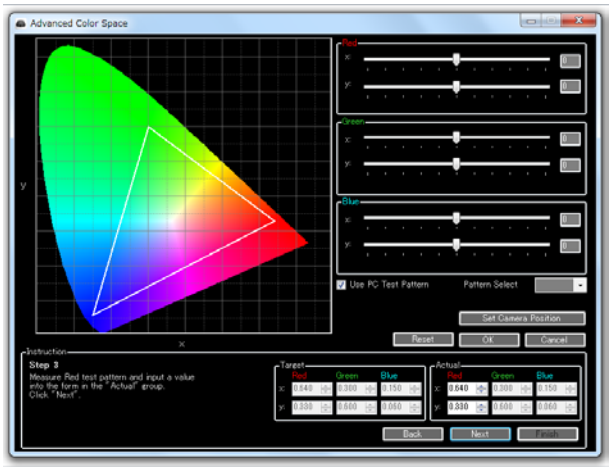
4-3-7. Advanced Color Space Adjustment

Three apexes of color space can be adjusted in two ways.

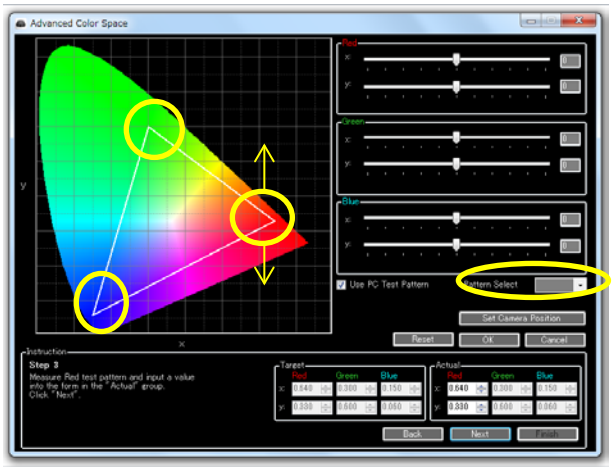
A. Manual adjustment
   Use test pattern to measure and adjust by changing Red, Green, Blue x-y values.

B. Interactive
   Set Target values and input measured values of Red, Green and Blue by following instructions of the software.



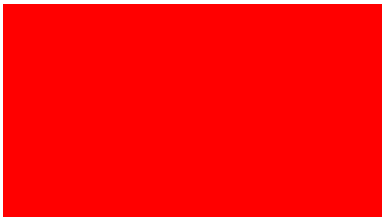
A. Manual adjustment

1. Show test pattern “Red” from “Pattern Select”
2. Measure the x-y value and then adjust by changing the values of “Red” x-y settings or dragging the diagram.

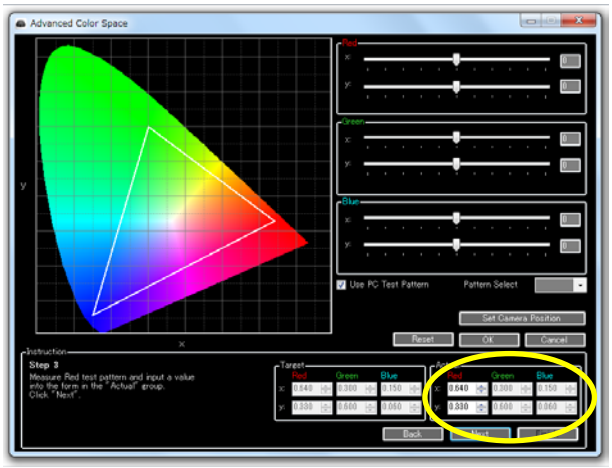


B. Interactive

1. Set a target RGB (default setting is BT709)
2. Click next to show “Red” and then measure x-y values
3. Input the measured value for Red



4. Click next to show “Green” and then measure x-y values
5. Input the measured value for Green



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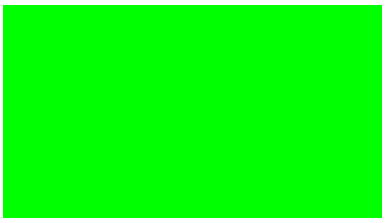
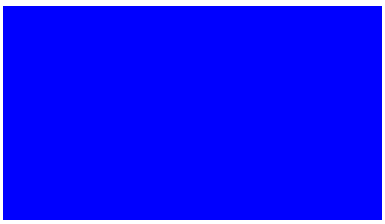


6. Click next to show “Blue” and then measure x-y values

7. Input the measured value for Blue



8. RGB apexes will be automatically adjusted to get desired settings.

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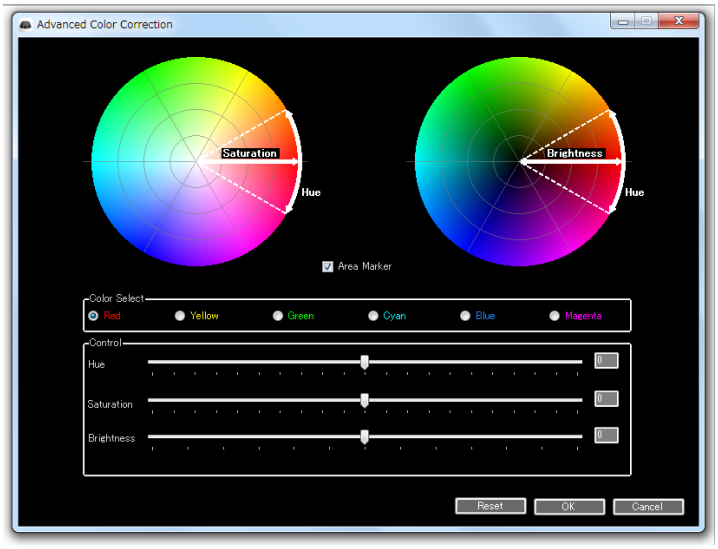
Company	Software	Manual version	Issued Date
Sony Corporation	Projector Calibration Pro	Version 0.01	Nov 17th, 2014

4-4. Other Functions under [Tools] menu

4-4-1. Advanced Color Correction

You can adjust Hue, Saturation, and Brightness for Red Green, Blue, Yellow, Magenta, and Cyan.



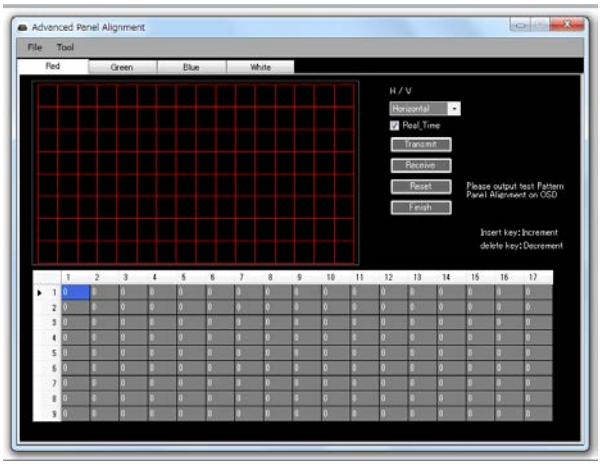
4-4-2. Advanced Panel Alignment

Panel alignment for each zone can be adjusted by the software.

Set values for each zone, then transmit.

Use [File] – [Export RCMS file] menu to copy adjusted panel alignment settings to your PC

Use [File] – [Import RCMS file] menu to import your panel alignment settings to the projector



3. Note

If you have any questions, please feel free to contact Sony counter persons in your region.

END

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